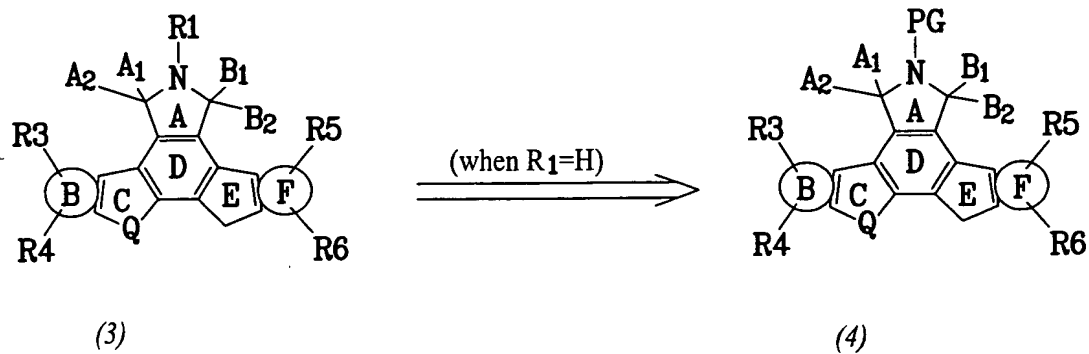




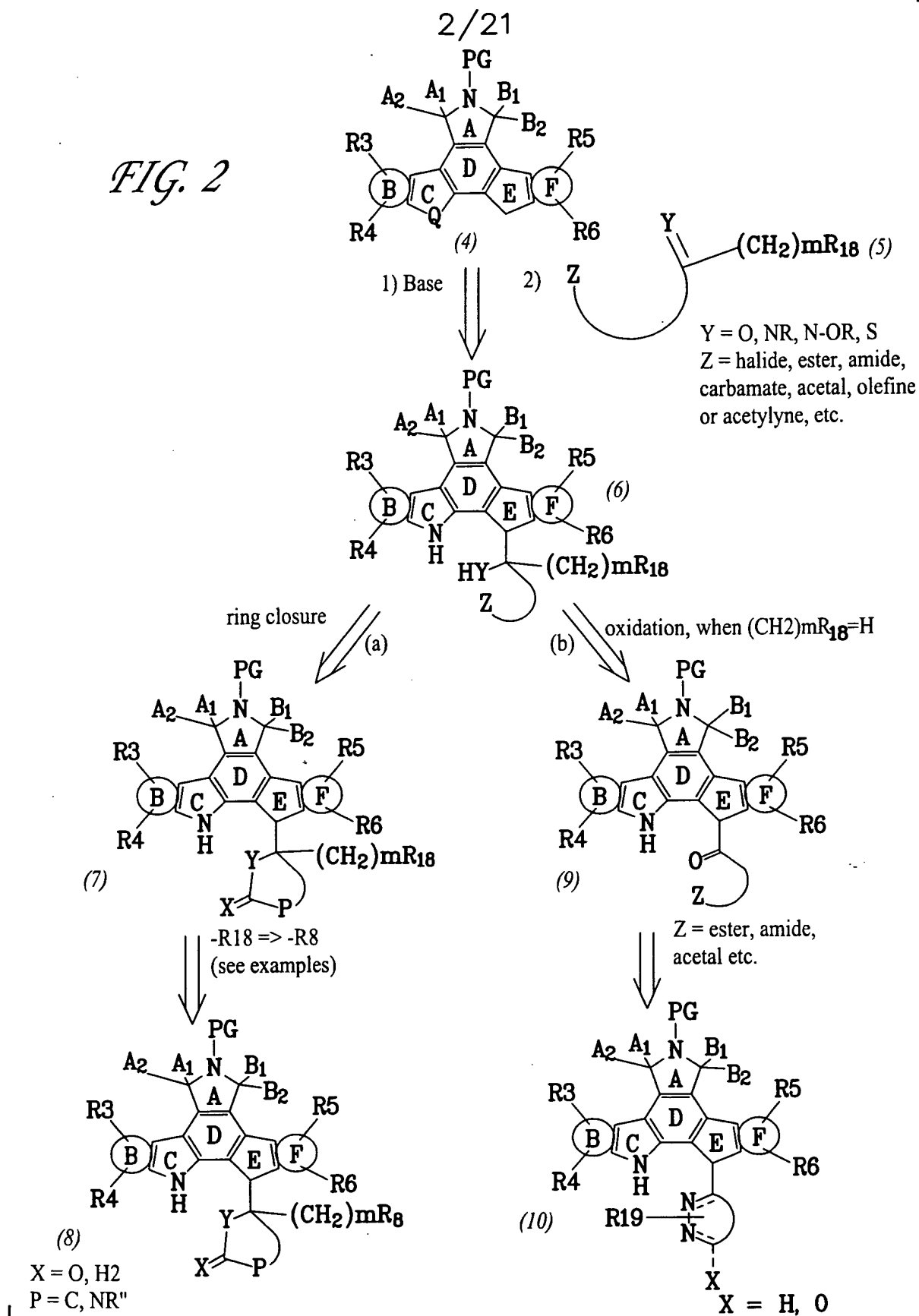
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*FIG. 1*



PG = Protecting Group  
or  
Polymeric Support

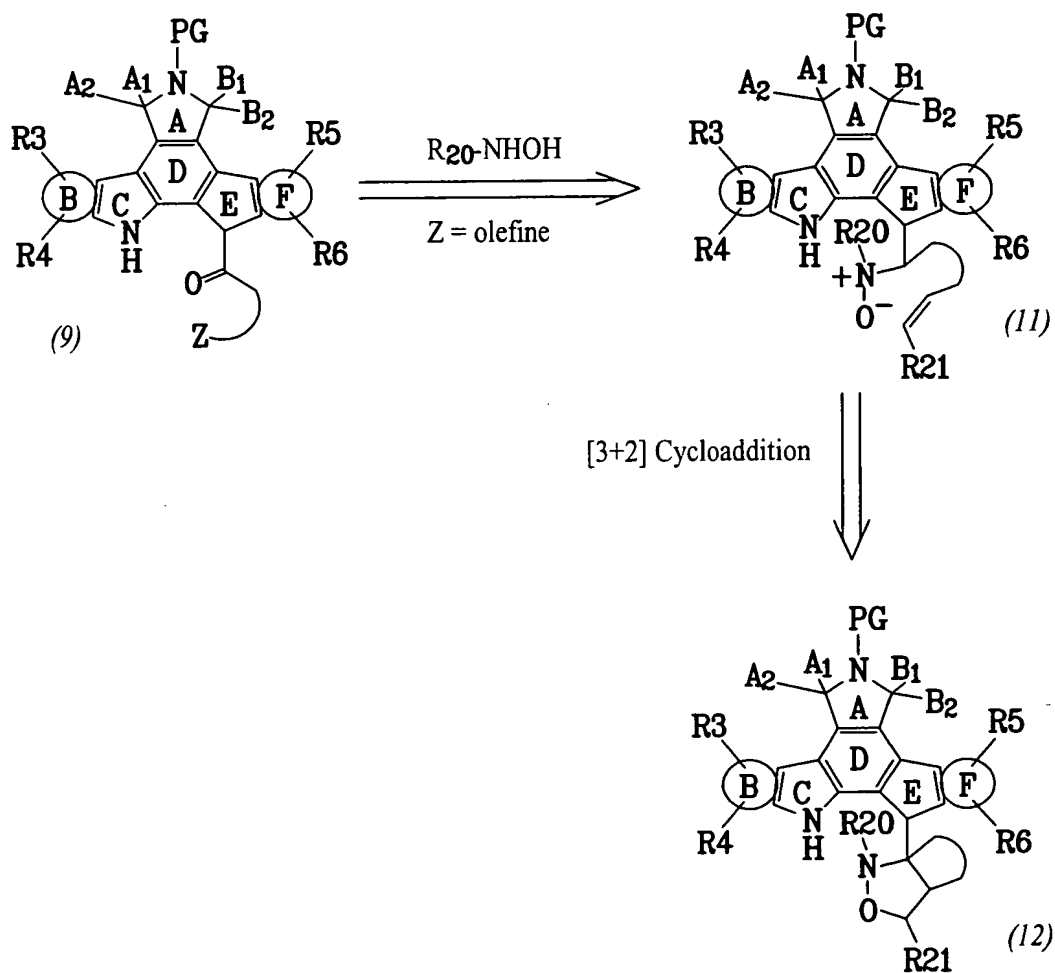
FIG. 2



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FIG. 3

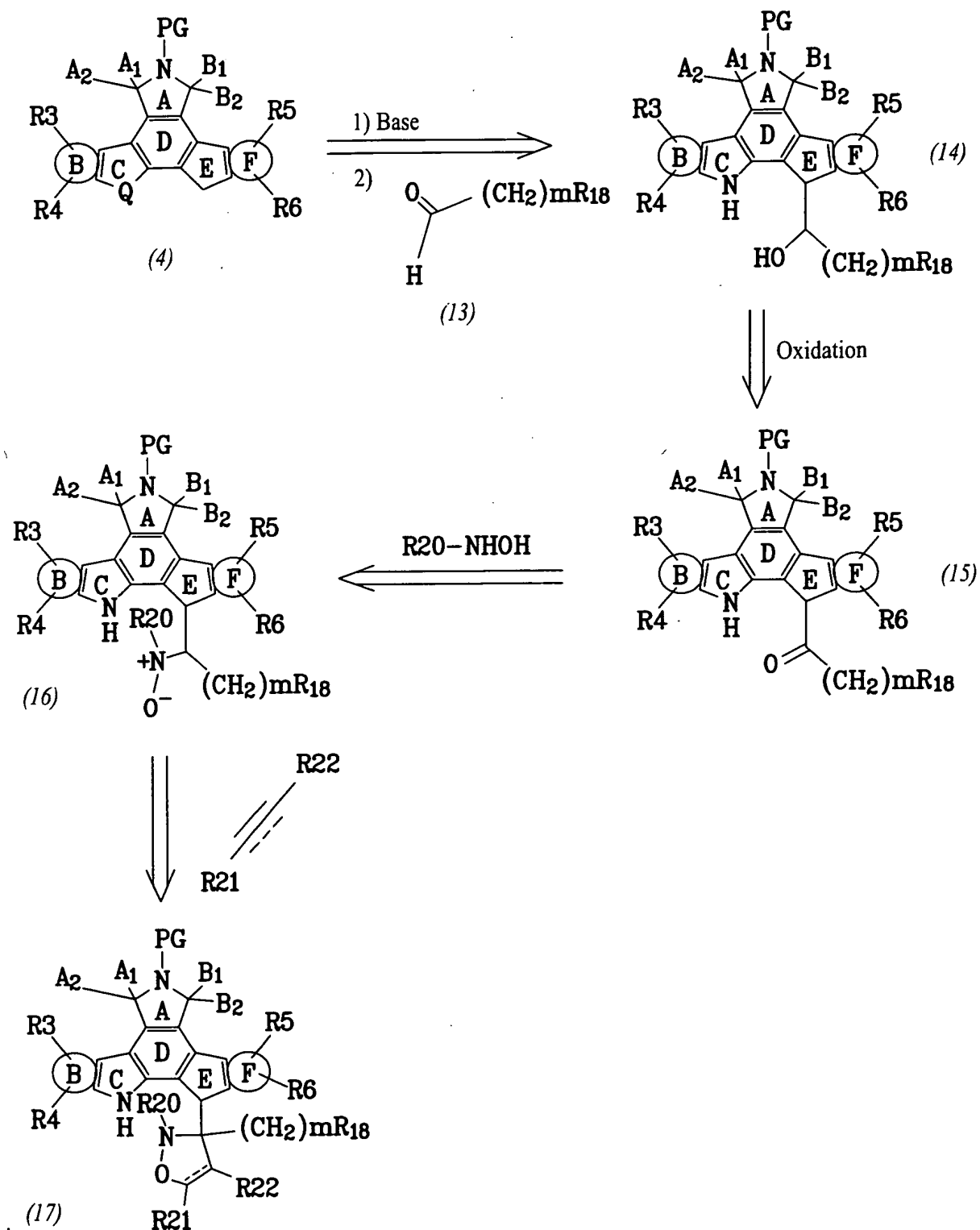
Preparation of Cyclic Substituents via Intra-Molecular Dipolar Cycloaddition



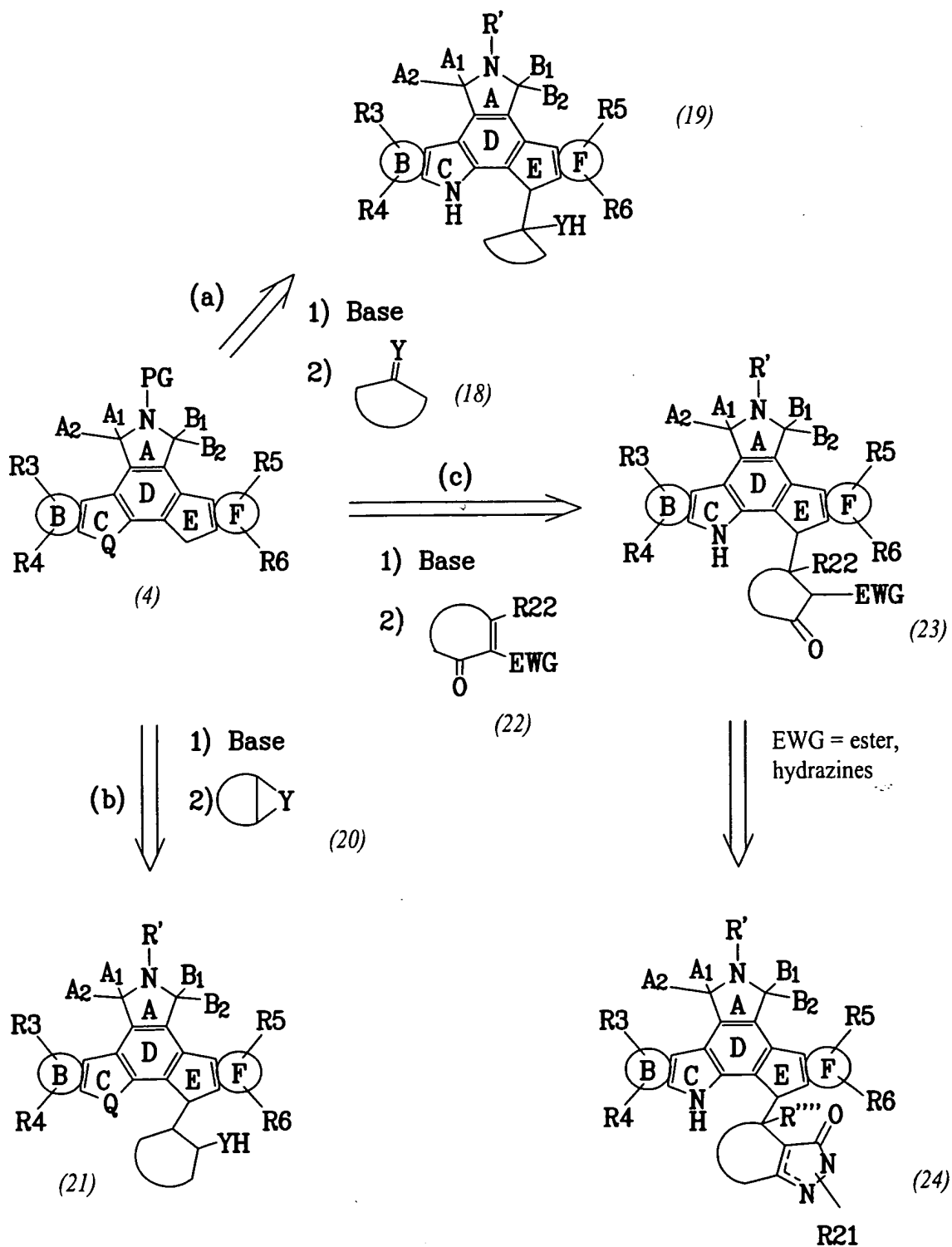


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*FIG. 4*

Preparation of Cyclic Substituents via Intra-Molecular Dipolar Cycloaddition

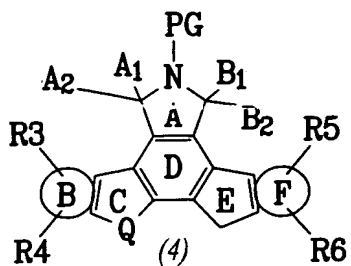


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FIG. 5

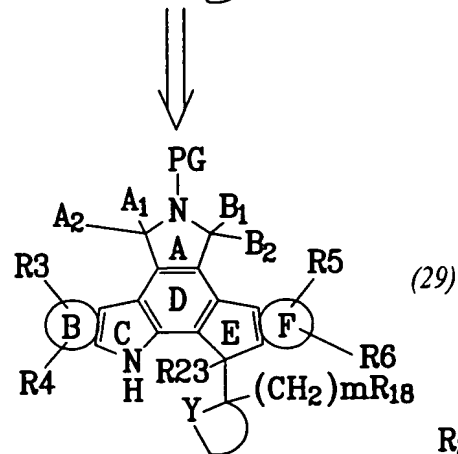
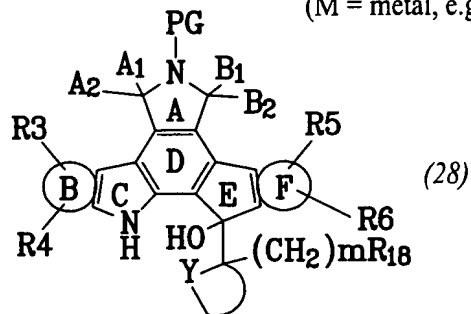
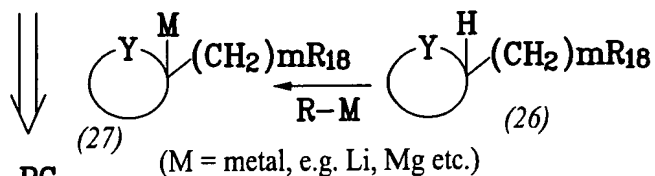
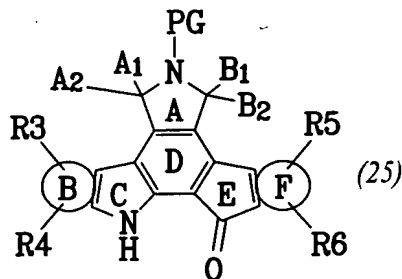


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FIG. 6



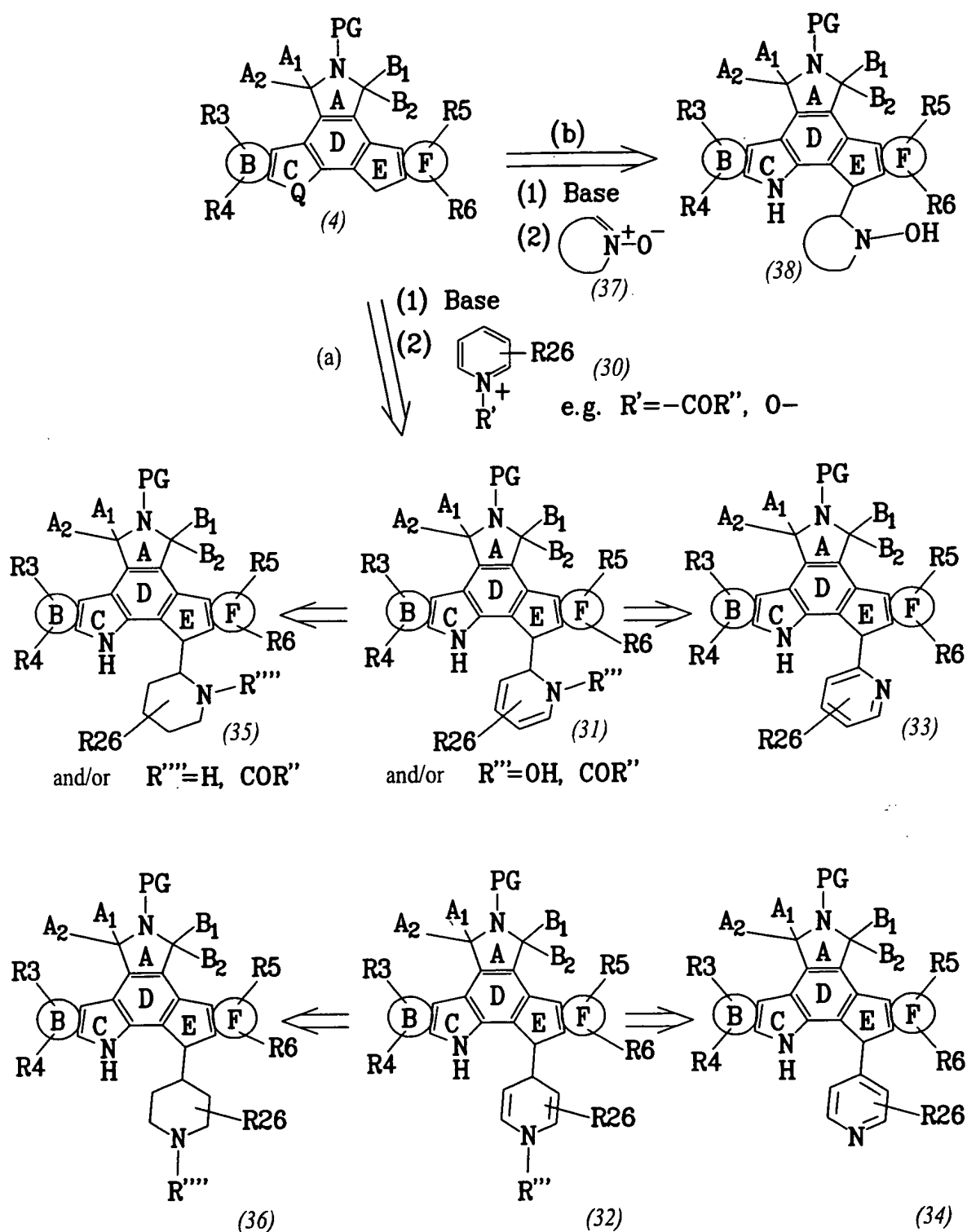
Oxidation



R<sub>23</sub> = F, SR, H etc.

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FIG. 7

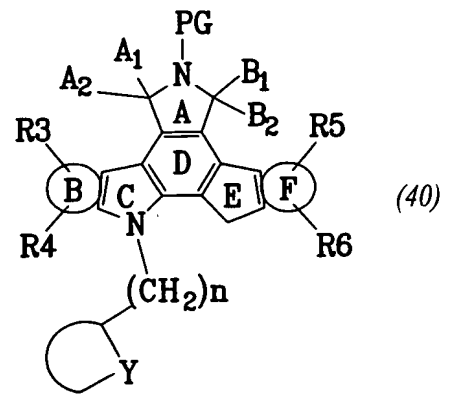
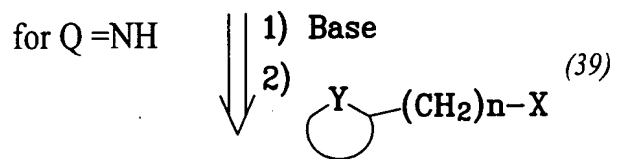
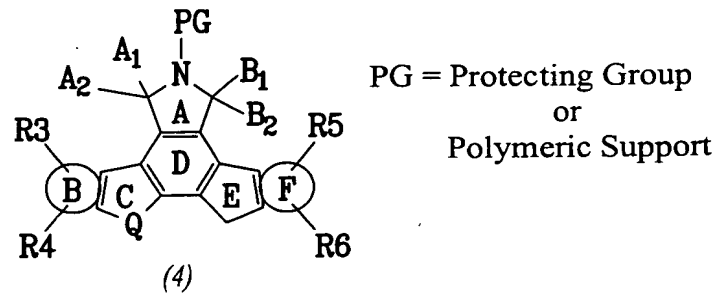




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FIG. 8

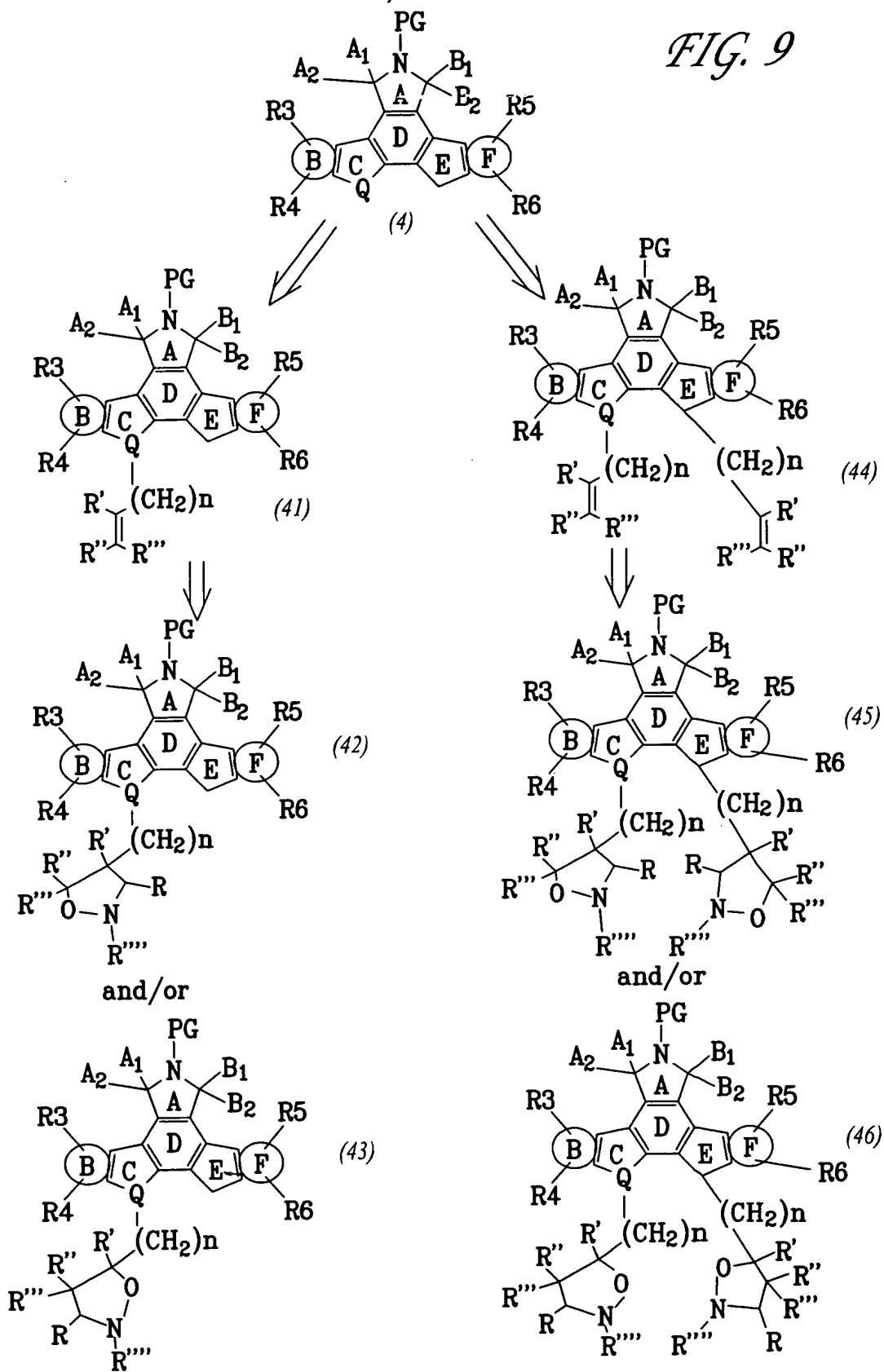


L



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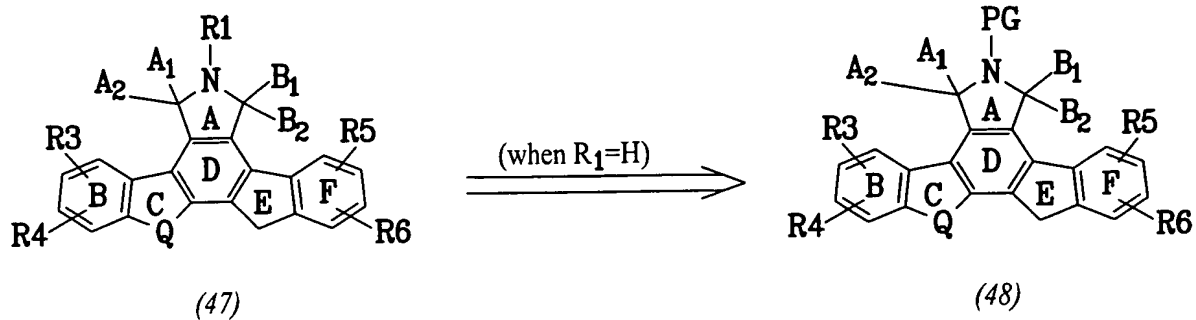
FIG. 9





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FIG. 10



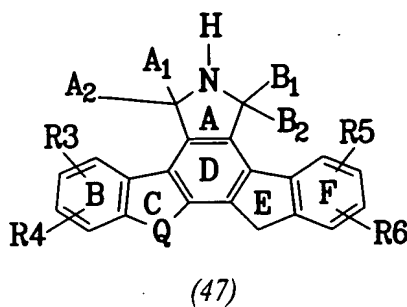
PG = Protecting Group  
or  
Polymeric Support



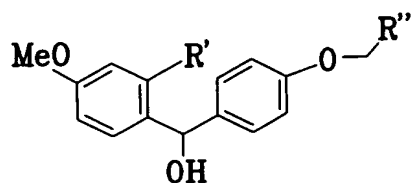
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FIG. 11

Preparation of Soluble and Resin-bound N-lactam  
 protected Fused Pyrrolocarbazoles (FP)



TsOH, Toluene, NMP, 140°C



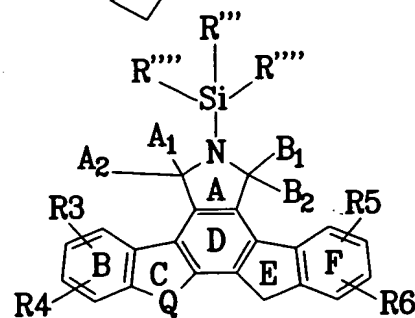
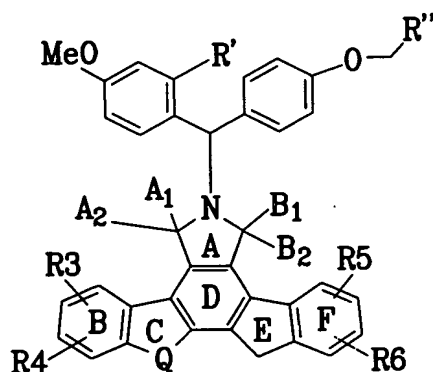
(51a)  $R' = H, R'' = H$

(51b)  $R' = OMe, R'' = \text{Polymer}$

$(R''')_2R''''Si-X$

Base

THF, DMF or NMP



(52)

$R''' = Me, R'''' = tBu$  (TBS)

$R''' = Ph, R'''' = tBu$  (TBS)

(49)  $R' = H, R'' = H \gg$  soluble protected FP  
 (N-protecting group abbreviated as DMB)

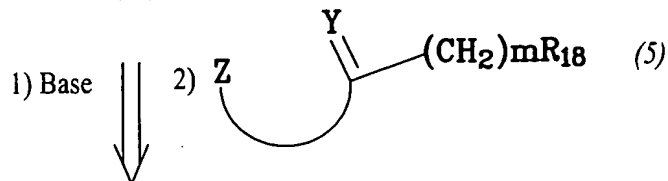
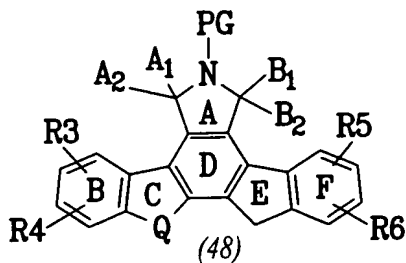
(50)  $R' = OMe, R'' = \text{Polymer} \gg$  solid-bound PG  
 (the resin reagent referred to as Rink-acid resin)  
 This is referred to in the text as "Resin"

(e.g. Polymer = copolystyrene-1%divinylbenzene)



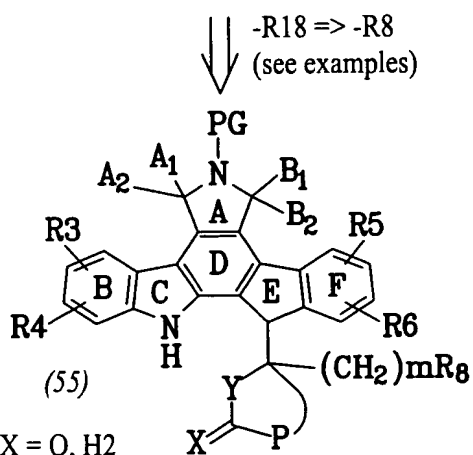
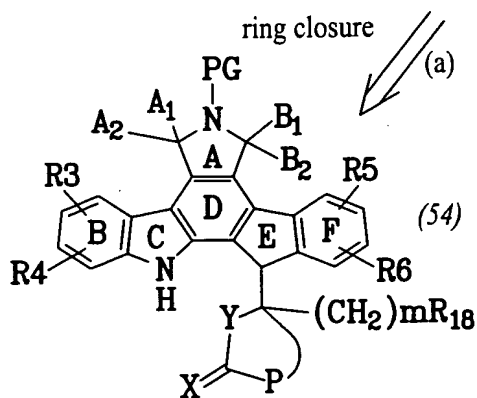
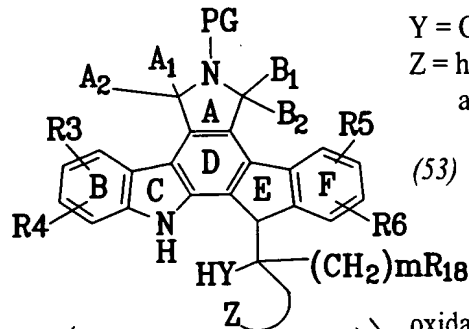
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FIG. 12

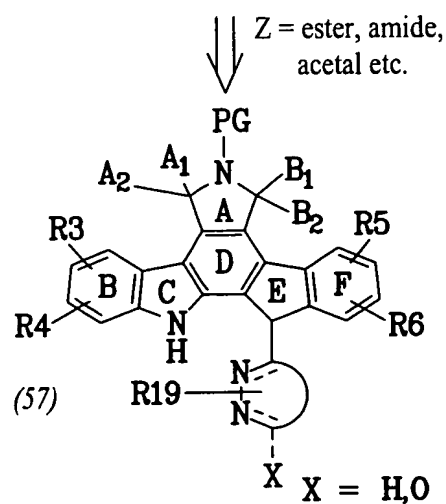
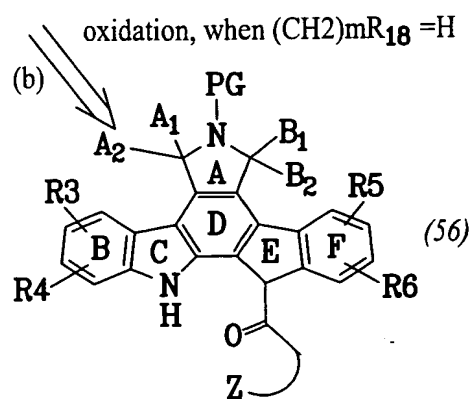


Y = O, NR, N-OR, S

Z = halide, ester, amide, carbamate, acetal, olefine or acetylene, etc.



X = O, H<sub>2</sub>  
 P = C, NR"



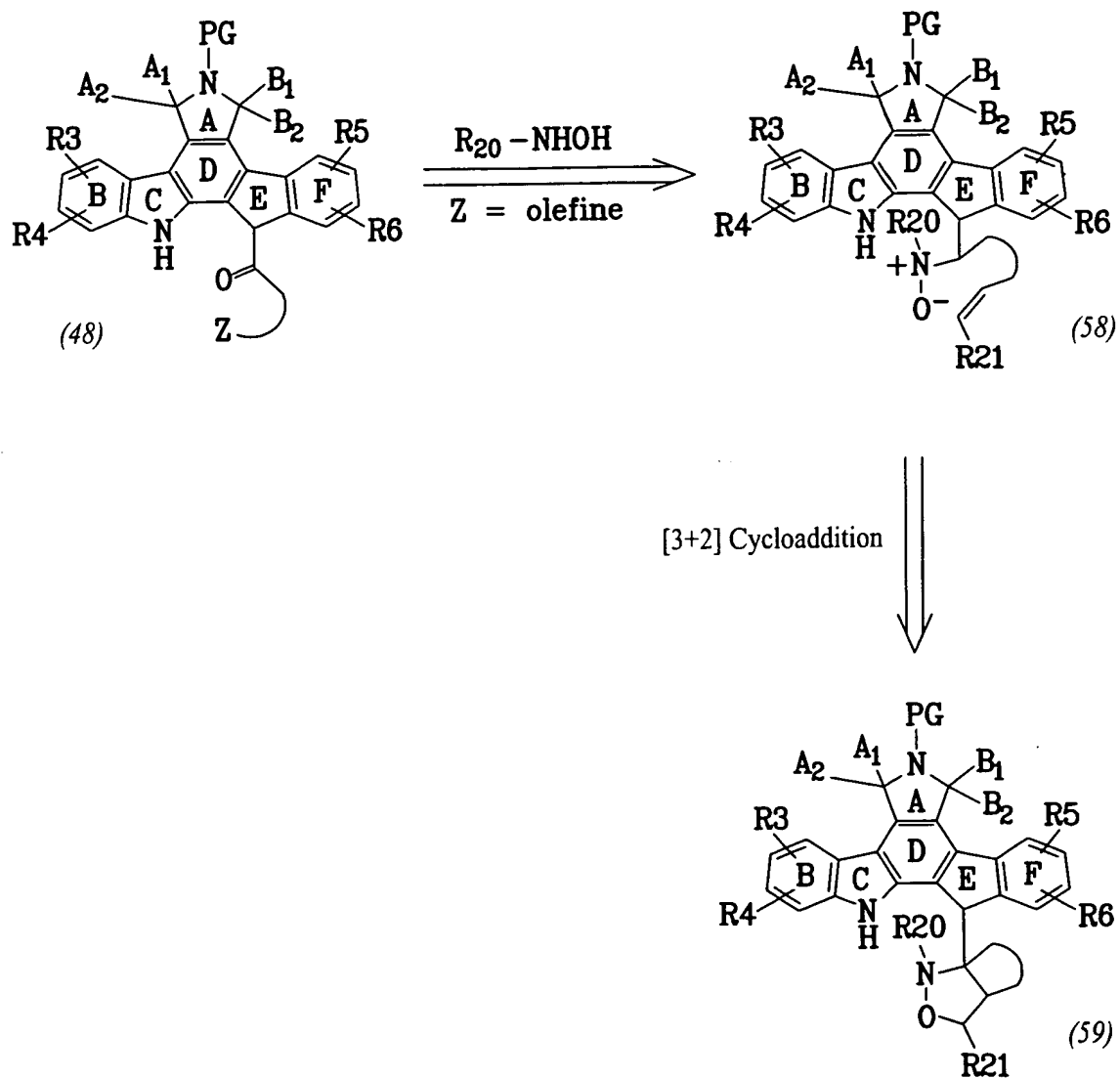
X = H<sub>2</sub>O



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FIG. 13

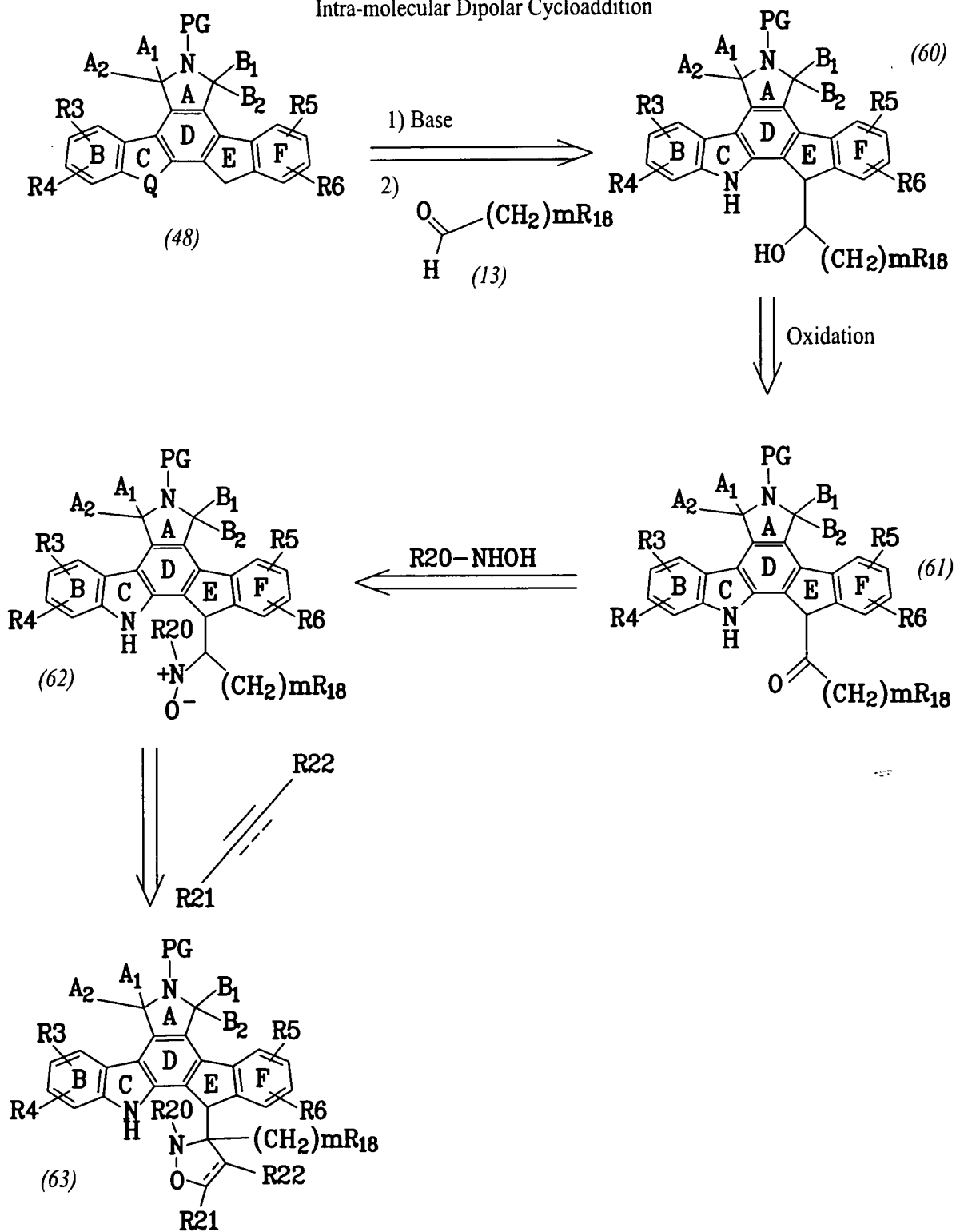
Preparation of Cyclic Substituents via Intra-molecular Dipolar Cycloaddition





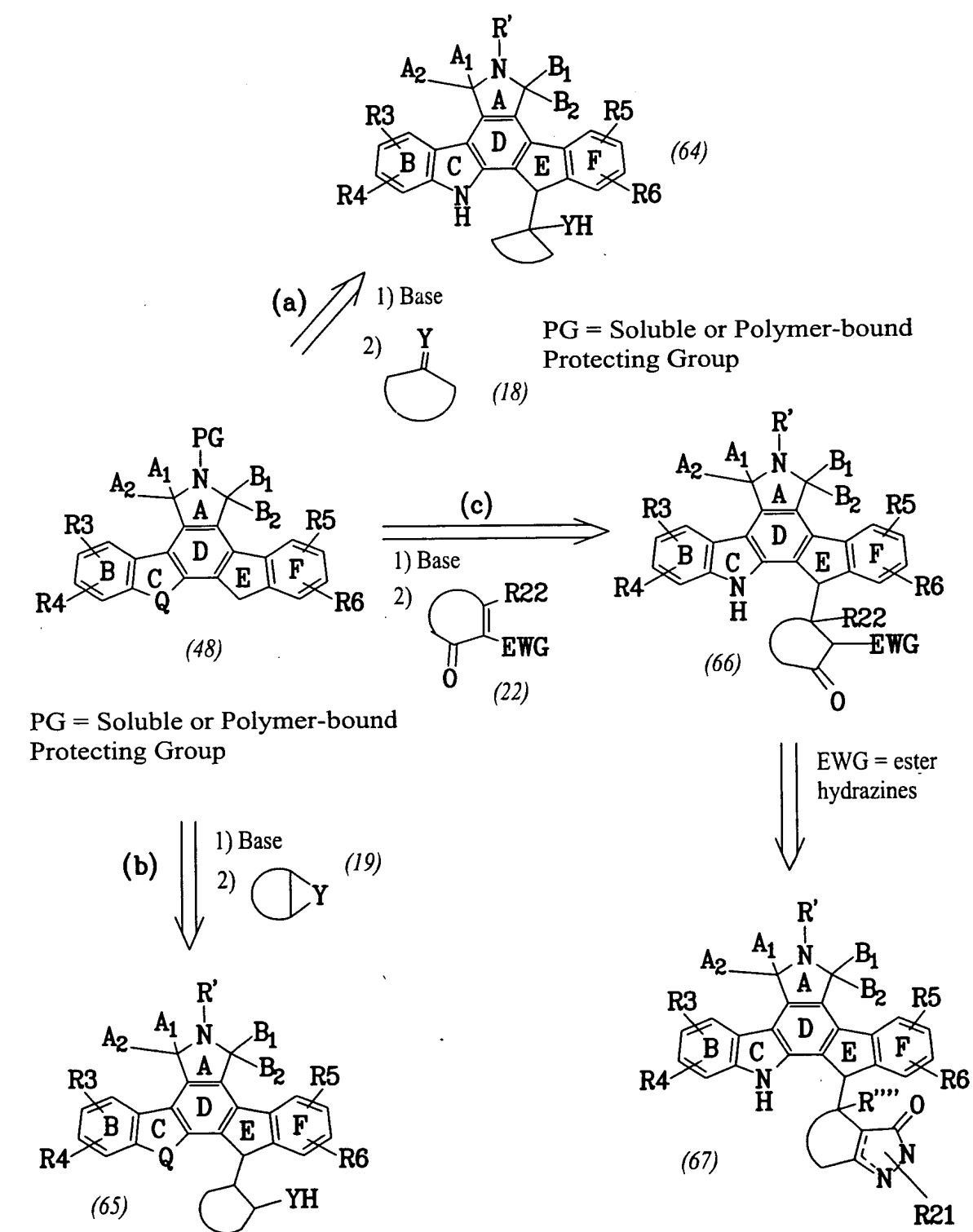
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*FIG. 14*

Preparation of Cyclic Substituents via  
Intra-molecular Dipolar Cycloaddition





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*FIG. 15*

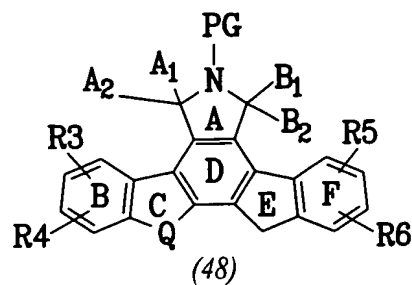




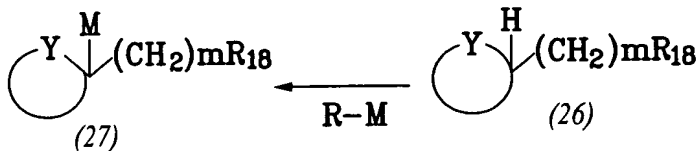
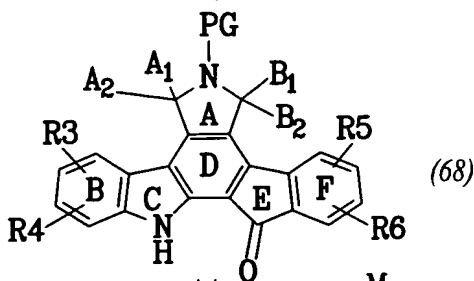
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*FIG. 16*

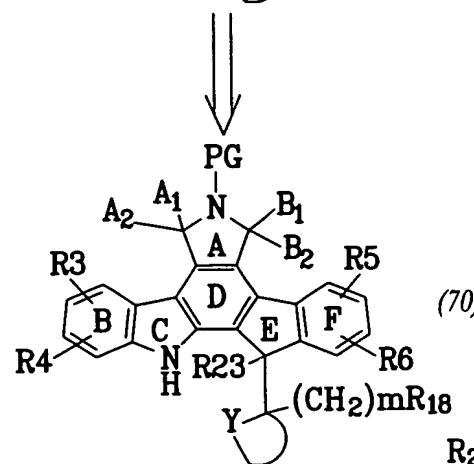
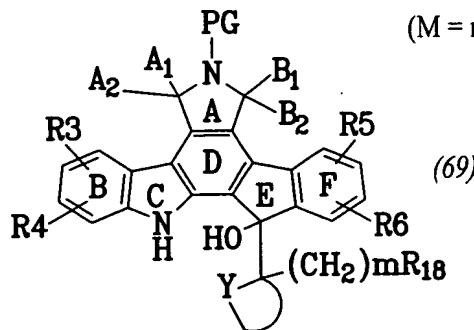
PG = Soluble or  
 Polymer-bound  
 Protecting Group



Oxidation



(M = metal, e.g. Li, Mg etc.)

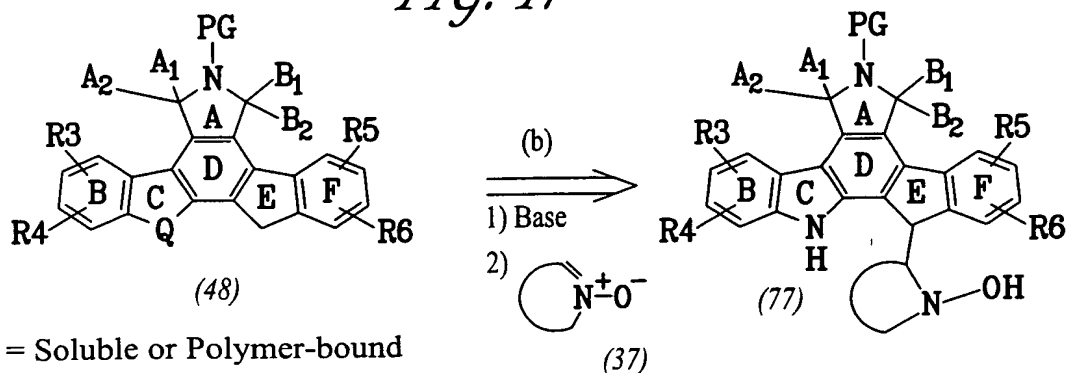


R<sub>23</sub> = F, SR<sub>24</sub>, H etc.

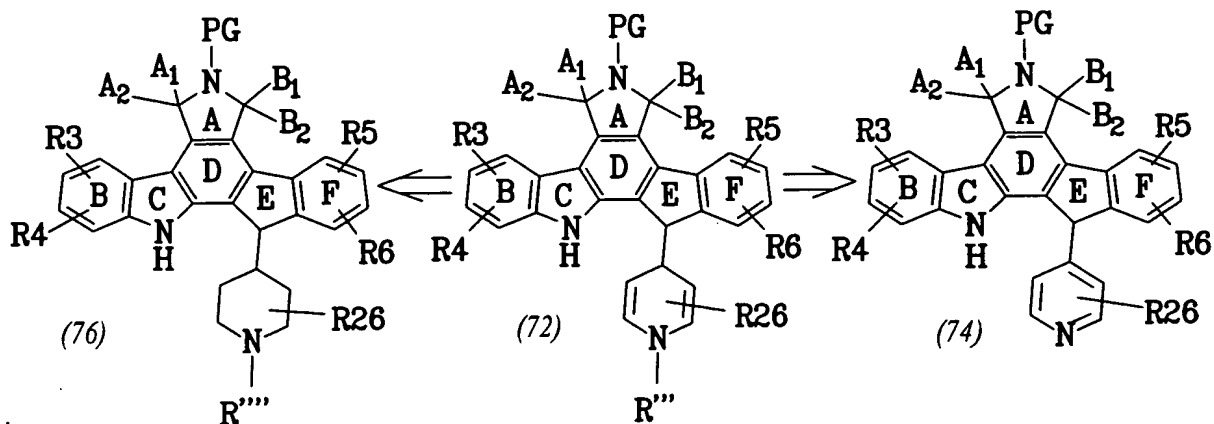
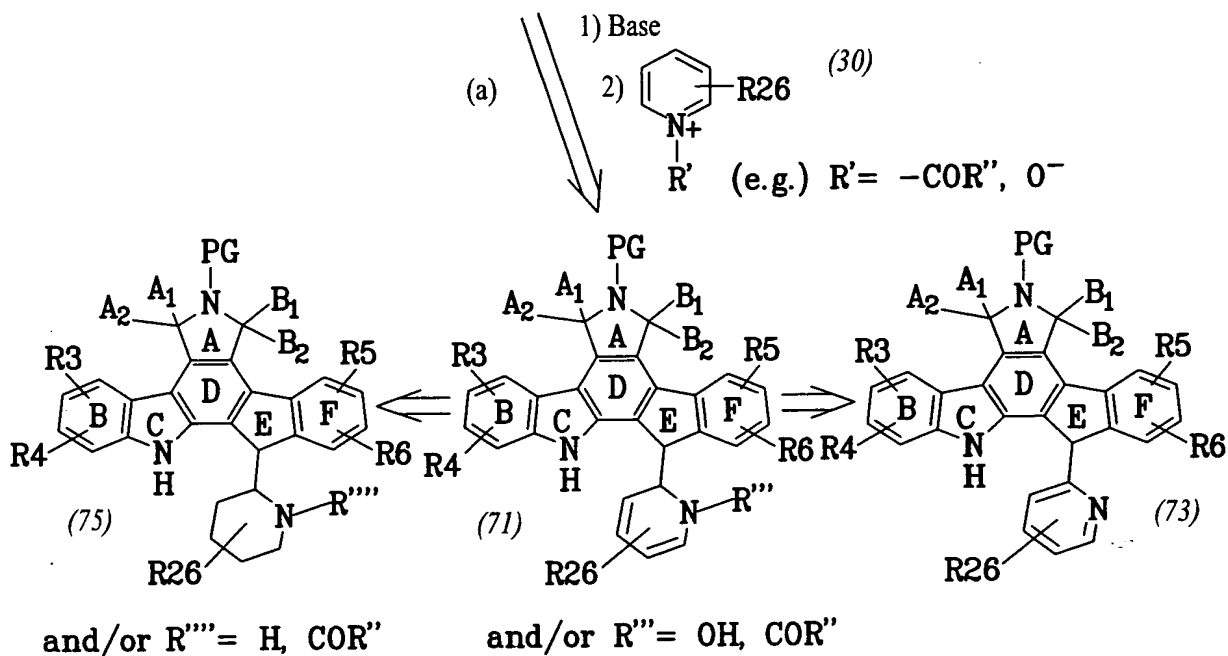


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FIG. 17



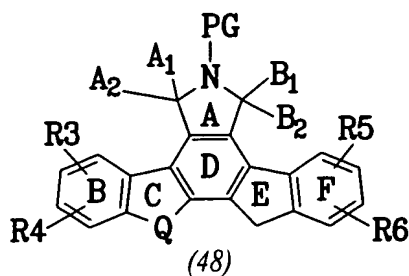
PG = Soluble or Polymer-bound Protecting Group



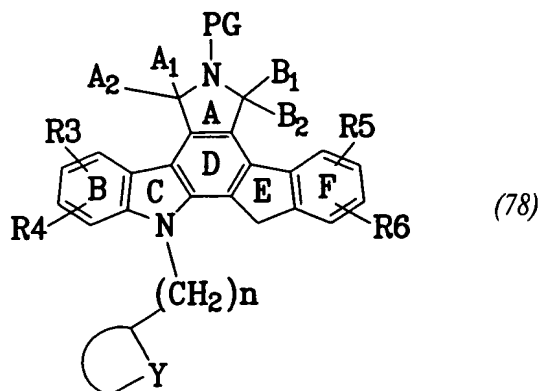
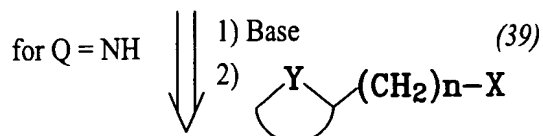


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FIG. 18



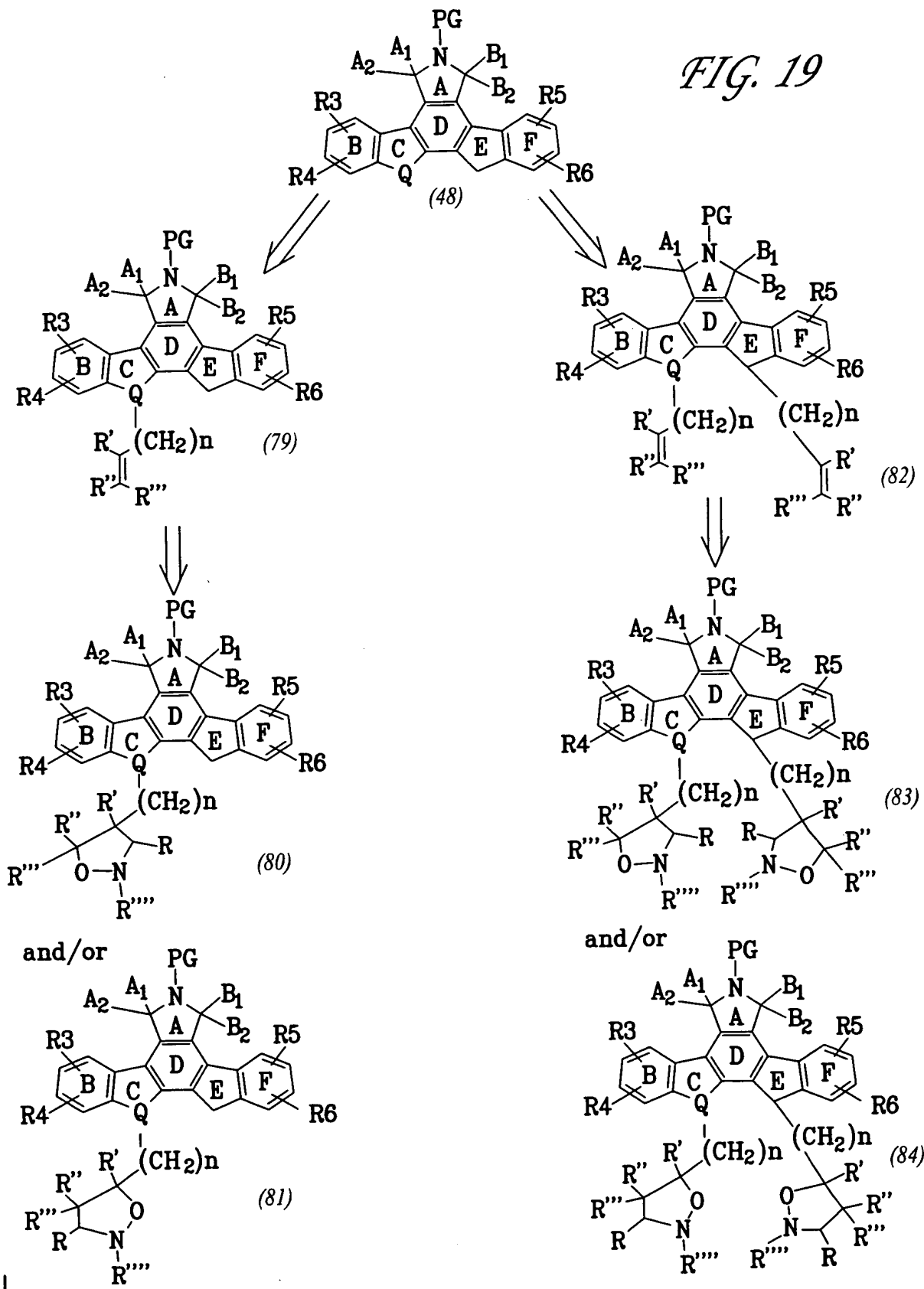
PG = Soluble or Polymer-bound  
Protecting Group





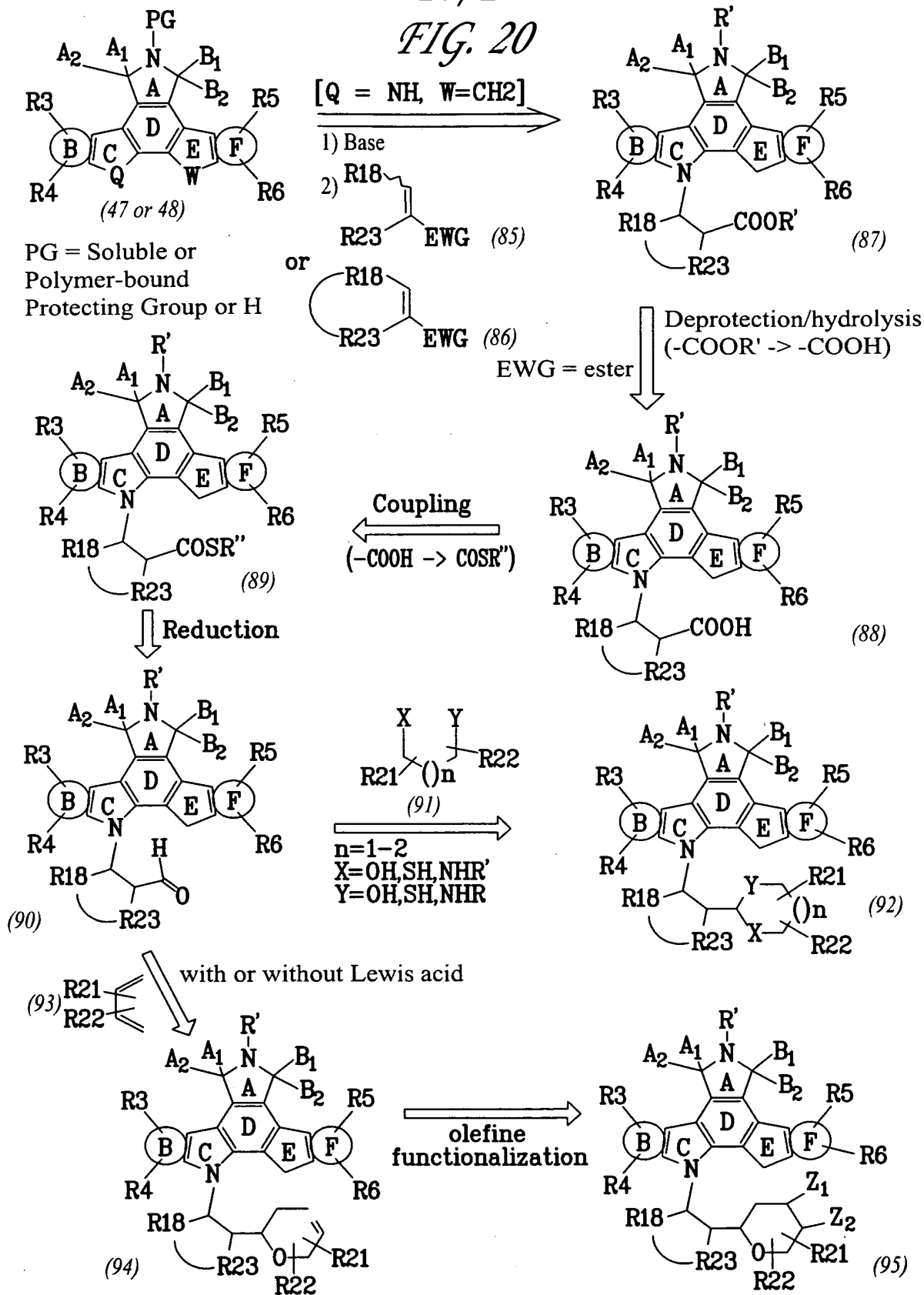
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FIG. 19



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FIG. 20



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FIG. 21

